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Physical Attributes as Indicator of Performance for Broad Jumping

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ABSTRACT

Aim: The Aim of the present study was to identify the talent for standing broad jump with the help of physical attributes.

Methodology: The sample of the present research work was selected from Govt Boys School Mansa of Mansa district (Punjab) a sample of 40 male students were taken 20 from the age group of 10-12 and 20 from the age group of 12-14. Tools-Height was measured by anthropometric rod set to the nearest 0.5cm.

Leg Length: The straight distance between head of the femur and lateral malleolus of fibula. Leg length was measured by anthropometric rod in centimetres to the nearest 0.5cm.

Age: Age of the students was verified from the school record.

Standing Broad Jump: The athlete stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed. Record the longest distance jumped, the best of three attempts. Steel tape was used to measure the distance and the same was recorded in centimetres to the nearest 0.5cm.

Statistical Analysis: The required data were collected by measuring leg length, Height, Age and standing broad jump. For the statistical analysis the Pearson's Co-relation statistical technique was employed.

Results: On the basis of findings it was found in the age group of 10-12 years there was moderate positive correlation between standing long jump and leg length, In case of height and age the correlation is positive but weak. In the age group of 12-14 years the correlation between standing broad jump and leg length is positive but weak. The relation of standing broad jump with height and age shows positive correlation but weak relation.

Conclusion: Physical attributes helps in talent identification in children's..

Key Words: Standing broad jump, Anthropometric rod, Leg length

INTRODUCTION

To achieve and attain top level performance in sports the dimension of body must correspond to the mechanical aspect of game/sports concerned. The success of top level players of the world lies in the selection of sports event according to the structure of sports event at the early stage these athletes have perfect correlation with the event. In developing countries the numbers of sports persons are more than the developed nations but the result are not as per participation the reason being wrong selection of sports events, in developing countries the selection of event is mostly influenced by facilities available in school and nearby no scientific technique is adopted to help the individual to select the sports event according to the structure of the body. While selecting the event most of the children were influenced by peer group, availability of coach, grounds, media and social infrastructure etc. Physical education teacher must bear in mind the growth pattern of students while selecting the game and training because children grow at different rates which affect their performance, many of the physical traits of children are acquired through heredity and influenced by environment so while selecting a sports event one must take these factors into consideration. Talent identification enable long range planning and decisions for top level performance. According to Bompa[1] (1999) there are two methods used for tal-

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ent identification(a) natural selection (b) scientific selection 'Natural selection' is aimed at identifying talented individuals that are already participating within a sport due to the recognition of performance or scouting. As such, 'natural selection' processes rely on talented individuals to 'happen upon' the sport they are most likely to excel in even though involvement may result purely from peer or parental interests, proximity of facilities, or of the sport's popularity in that geographical area. 'Scientific selection' processes can be viewed as a more proactive procedure by which identification of the talented occurs as a result of testing individuals on values that are associated with expertise within a certain sport. For example, what are the physical, physiological and psychological attributes that affect performance within football or sprinting? By using scientific research to identify the criteria that elite athletes possess, and the optimum environment for nurturing these criteria, resources can be targeted at those individuals that have the greatest potential of becoming outstanding performers. In fact, the early identification of the talented has been highlighted as one of the most important concerns of contemporary sport. Advantages of Using Scientific Criteria in the Process of Talent Identification are.

1. Substantially reduces the time required to reach high performance by selecting individuals who are gifted in sport
2. Eliminates a high volume of work, energy, and talent on the part of the coach. The coach's training effectiveness is enhanced by training primarily those athletes with superior abilities
3. Increases competitiveness and the number of athletes aiming at and reaching high performance levels. As a result, there is a stronger and more homogenous national team capable of better international performance
4. Increases an athlete's self confidence, because his or her performance dynamics are known to be more dramatic than other athletes of the same age who did not go through the selection process.
5. Indirectly facilitates applying scientific training, because sport scientists who assist in talent identification can be motivated to continue to monitor athletes training.

In jumping events leg power is required for that the size and structure of the jumper plays important role for high end performance so a right kind of athlete be selected for the event. Wakai and Linthorne [3]in (2005) found in their study that body dimensions may significantly affect performance when Standing Broad jump is used for the assessment of leg muscle power in children, since taller individuals may jump longer than shorter ones with the same leg muscle power. The most important factors for this outcome are the higher centre of mass and the longer leg length in taller children, which increase the trajectory of the centre of mass and thus Standing Broad jump performance. In the present study we will identify the jumping abilities among the school children's by measuring body dimension and through broad jump testing, which help the students to know their abilities and helps the students to select the sports event it also help the coaches to train the children according to their potential.

Aim of the Study: The purpose of this study is to identify the talent among school children's and help them to select the sports event according to their physical attributes.

Methodology

Sample- The sample of the present research work was selected from Govt Boys School Mansa of Mansa district (Punjab) a sample of 40 male students were taken 20 from the age group of 10-12 and 20 from the age group of 12-14.The subjects were selected randomly.

Statistical Analysis – To find the correlation between the variables the data on Broad Jump, Leg Length and Height were analysed by applying Carl Pearson correlation. The discussion and analysis will reveal the results in the following tables.

Tools

Height- The anthropometric rod was used for measuring height. The subjects were made to stand bare footed against a wall with his heels, buttocks, and upper back and back of head in contact with the wall. The heels were touching each other and head was so held that the Frankfurt plane was horizontal. Arms were hanging down on the sides. The anthropometric rod was held vertically and the horizontal arm was brought so that it touched the highest point on the head in the mid saggital section (vertex). Height was taken without socks. Height was recorded to 1/10 of a centimetre.

Leg Length: The straight distance between head of the femur and lateral malleolus of fibula. Leg length was measured by anthropometric rod in centimetres to the nearest to 1/10 of a centimetre.

Age- Age of the students was verified from the school record.

Standing Broad Jump- The athlete stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed. Record the longest distance jumped, the best of three attempts. Steel tape was used to measure the distance and the same was recorded in centimetres to the nearest 0.5cm.

Table 1: Correlation of Physical Attributes with Standing Broad Jump in the Age group of 10-12 years

Age 10-12 Years					
leg length		Broad Jump			
Mean	$(X-M_x)^2$	Mean	$(X-M_y)^2$	$(X-M_x)(Y-M_y)$	R
0.76	0.051	1.422	0.305	0.065	0.5161
Height		Broad Jump			
Mean	$(X-M_x)^2$	Mean	$(X-M_y)^2$	$(X-M_x)(Y-M_y)$	R
1.39	0.157	1.422	0.305	0.007	0.0338
Age		Broad Jump			
Mean	$(X-M_x)^2$	Mean	$(X-M_y)^2$	$(X-M_x)(Y-M_y)$	R
11.22	7.792	1.422	0.305	0.677	0.4396

Results of the Study

As evident from table 1, In the age group of 10-12 years the mean of leg length 0.76 and mean value of standing broad jump is 1.422 shows a moderate positive correlation having R value 0.5161, indicating that with the increase of leg length the standing broad jump increase. Paul Pradip Kumar[8] (2013) Xavier Maria Raj[15](2017) supports the results of the above study. A weak correlation exist between height having mean value of 1.39 and Standing Broad jump having mean value of 1.422 and value of R is 0.0338 indicating weak positive correlation, the results indicates that performance in standing broad jump is not strongly affected by height. Joshi Deepti and Kumar Ajay[12] (2016) support the results of the above study. In case of Age and standing broad jump the value of R is 0.4396. Although technically a positive correlation, the relationship between age and standing broad jump is weak having mean value of age 11.22 and standing broad jump 1.422, indicates that age has no direct impact on the performance standing broad jump.

Table 2: Correlation of Physical Attributes with Standing Broad Jump in the Age group of 12-14 years

Age 12-14 years					
leg length		Broad Jump			
Mean	$(X-M_x)^2$	Mean	$(X-M_y)^2$	$(X-M_x)(Y-M_y)$	R
0.838	0.045	1.575	0.409	0.033	0.2441
Height		Broad Jump			
Mean	$(X-M_x)^2$	Mean	$(X-M_y)^2$	$(X-M_x)(Y-M_y)$	R
1.45	0.225	1.575	0.409	0.067	0.2224
Age		Broad Jump			
Mean	$(X-M_x)^2$	Mean	$(X-M_y)^2$	$(X-M_x)(Y-M_y)$	R
12.671	3.219	1.575	0.409	0.024	0.0208

From the above table-2 in the age group of 12-14 although technically a positive correlation exist between leg length and standing Broad jump having value of R is 0.2441 and having leg length mean value of 0.838 and standing Broad jump mean 1.57,5 but the relationship between variables is weak, shows that performance in standing broad jump is not dependent on leg length. The correlation between height and standing Broad jump is technically a positive correlation having R value 0.2224 the mean value of height is 1.45 and of standing Broad jump is 1.575 but the relationship between height and standing Broad jump is weak, the results indicates that height is not the criterion for the performance of standing Broad jump, the study conducted by Veligekas Panayiotis, Tsoukos Athanasios, & Bogdanis Gregory C[7] (2012) were also of the opinion that broad jump is not affected by leg length and height . In case of age and standing Broad jump having mean value of 12.671 and 1.575 respectively, having value of R 0.0208 technically showing positive correlation but the relationship between age and standing Broad jump is weak, indicating that with the increase in age the performance in standing Broad jump does not increase.

DISCUSSION

The results of the present study showed that in the age group of 10-12 years the leg length had a moderate correlation with standing broad jump. The relationship of height with standing broad jump is positive but weak in nature. In case of age its relation with standing broad jump had positive correlation but weak in nature. In age group of 12-14 years the correlation between leg length and standing broad jump is technically positive but weak. In the category of height and age the relationship with standing broad jump shows positive correlation but weak in nature. From the above results it is evident that parameters like leg length, height and age had less impact on the performance of standing broad jump. The performance in standing broad jump depends on many factors like leg muscle mass, length of lower leg, length of upper leg, dimension of foot, centre of gravity, acceleration abilities of limbs, approach angle, takeoff angle, landing technique, approaching speed, leg power, kinanthopometric measurements of body, body mass index and some other biomechanical factors. As the sample taken for the study is of growing age and the aim of our study is to identify the talent among children's, only three variables were studied so to find evidence of their impact on the performance of standing broad jump, determining these factors as indicator of performance is premature at this stage. Wider factors must be stud-

ies to find out the talent among the teenagers to help them to choose sportive event according to their body dimensions and capabilities.

CONCLUSION

The following conclusions were drawn from the present study.

In the age group of 10-12 years moderate positive correlation exist between leg length and standing broad jump. A weak positive correlation exists between height, age and standing broad jump.

In the age group of 12-14 years a weak positive correlation exists between leg lengths, height, age and standing broad jump. Hence we came to conclusion that physical attributes helps in talent identification in children's.

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